

Swiss Monetary Targeting 1974–1996: The Role of Internal Policy Analysis

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1. Introduction

The Swiss National Bank (SNB), Switzerland's central bank, adopted monetary targeting at the end of 1974. The switch to a "monetarist" policy strategy was motivated by the global surge in inflation setting in towards the end of the 1960s. Since Switzerland adhered to a fixed exchange rate at that time, the SNB was not able to shield the domestic economy from foreign inflation. Although it strove to curb the price increases by means of quantitative restrictions on domestic credit growth, its efforts to check inflation were of no avail. On the contrary, in as much as the SNB's tight monetary policy had some effects on domestic prices and production costs, it caused substantial surpluses in the balance of payments on current account. The favourable current-account developments in turn led financial market participants to believe that, sooner or later, Swiss monetary authorities would have to raise the exchange rate of the Swiss franc. The resulting inflows of speculative capital swelled the domestic monetary base and undermined the SNB's efforts of keeping inflation under control.

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In 1971 the inflows of speculative capital assumed alarming proportions. Within a few months, the monetary base increased by over 50 percent (Fig. 1). The SNB was clearly aware of the inflationary dangers emanating from this Latin American type of explosion in the money supply. As a staunch supporter of the gold standard, it had always warned against the potential inflationary consequences of detaching domestic money creation from the scarce world supply of gold.¹ In an effort to reduce or contain the monetary overhang, Swiss monetary authorities accepted two revaluations of the Swiss franc in 1971, the second in the context of the Smithsonian realignment of exchange rates. Moreover, they imposed restrictions on inflows of foreign capital and introduced various devices designed to sterilise part of the increase in the monetary base.² However, these measures only provided a temporary respite from the speculative activity on the foreign exchange markets. When a new disruptive speculative attack loomed in January 1973, Swiss monetary authorities, reluctantly, decided to float the Swiss franc on the foreign exchange market.³

Thanks to the switch to a floating exchange rate, the SNB, in principle, gained full control of the money supply. It employed its new powers to fight inflation, which had already crept up to about 7 percent early in 1973. To this end, the SNB ceased intervening on the foreign exchange market and kept the monetary base more or less stable until the summer of 1974 (SCHILTKNECHT, 1977, pp. 13–16). However, inflation, measured in terms of the CPI, continued to rise, peaking at over 10 percent in 1974 (Fig. 1). The Swiss public regarded inflation in excess of 10 percent as a major catastrophe, as the rate of increase in the CPI had not normally reached such high levels, except during the two world wars. Of course, keeping the monetary base stable while inflation was running at over 10 percent implied an extremely restrictive monetary policy. The SNB knew that it could not maintain such a tight stance for long without inflicting undue hardship on the economy. In the summer of 1974, it began to increase the monetary base again. Moreover, it searched for a monetary policy approach that would guarantee price stability in the longer run and simultaneously allow the Swiss economy to exploit its growth potential.

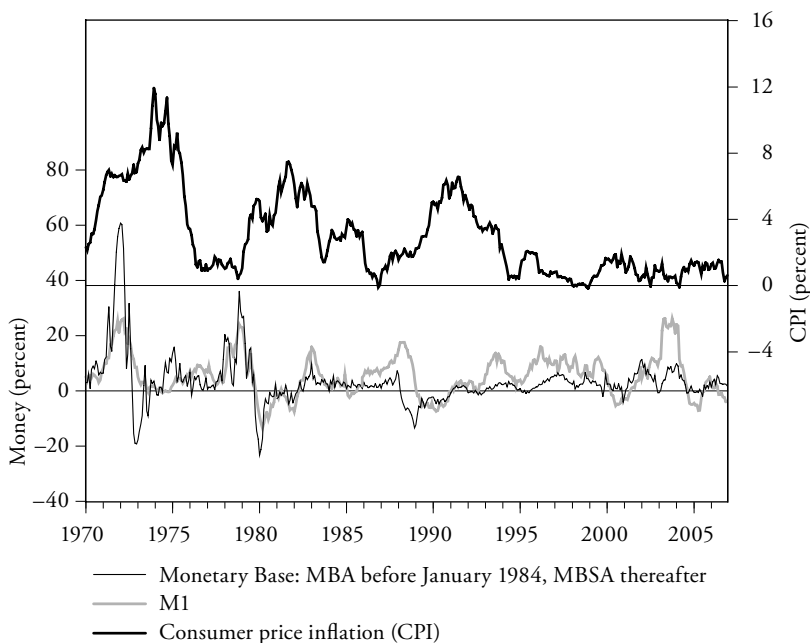
Considering its views about money and inflation, not surprisingly, the SNB opted for a monetarist approach to policy making. At the end of 1974, it announced that the following year it would increase the money stock M1 by

1 See, for example, the address by President Stopper to the 1971 annual meeting of the SNB.

2 SNB (1982, pp. 230–235) contains a good description of these measures.

3 Address by President Stopper to the 1973 annual meeting of the SNB.

Figure 1: Growth in the Monetary Base and M1 and CPI Inflation
(Monthly year-on-year rates of change)



Source for all the figures: SNB, Monthly Statistical Bulletin, Historical Time Series, and internal data.

M1 before 1986 excludes Liechtenstein and various transactions accounts.

6 percent. From the growth target for M1, it derived and announced an analogous subsidiary target for the monetary base, which also amounted to 6 percent. It continued to fix annual growth targets for M1 until the end of 1977, but it soon ceased to publish the subsidiary targets for the monetary base. After a brief interlude of targeting the exchange rate in 1978/79, the SNB altered its monetary targeting approach at the end of 1979. It decided to bypass the aggregate M1 and to announce annual growth targets directly for the monetary base. Although the monetary base remained the SNB's target variable until 1999, it modified its targeting approach again at the end of 1990. In lieu of announcing annual growth targets for the monetary base, the SNB introduced a medium-term targeting strategy. It began to publish five-year target paths for the monetary base. Since

the medium-term strategy ran up against a number of difficulties, the SNB at the end of 1999 decided to abandon monetary targeting altogether and to switch to a policy approach based on inflation forecasts.

Due to the adoption of monetary targeting, the SNB was able to reduce inflation quickly. In the course of 1976, it managed to restore price stability as inflation fell to about 1 percent. However, while the SNB was able to keep the trend increase in the CPI at low levels, it was less successful in avoiding a temporary resurgence of inflation in 1980/81 and in 1989/90 (Fig. 1). For these reasons, until the early 1990s, the SNB's inflation performance, though good by comparison with most other central banks, was not spectacular by any means, as the annual increase of the CPI averaged 3.4 percent from 1977 to 1993. Since the beginning of 1994, the Swiss inflation record has become much better, with the average rate of increase in the CPI declining to as little as 0.9 percent per year.

The SNB's approach to monetary targeting has been analysed extensively (especially, SNB, 1982; SCHILTKNECHT, 1983; BALTENSPERGER, 1984, 2007; GENBERG and KOHLI, 1997; RICH, 1997, 2000, 2002; LAUBACH and POSEN, 1997; BERNANKE et al., 1999; KUGLER and RICH, 2002; BERNHOLZ, 2007; PEYTRIGNET, 2007). These studies examine the choice of monetary aggregates, as well as the reasons for switching to a medium-term targeting strategy and for abandoning monetary targeting. They also assess critically the SNB's record in achieving and maintaining price stability, and in communicating its policies to the public. Although they discuss the advantages and disadvantages of the various targeting approaches followed by the SNB, they only throw limited light on a crucial aspect of monetary targeting. They fail to provide a comprehensive analysis of the role played by the monetary aggregates in setting monetary policy and in communicating the SNB's policy decisions to the public.

The purpose of this study is to fill the gap in existing research. To identify the role played by the monetary aggregates, I examine critically the SNB's internal policy analysis. Moreover, I review the SNB's efforts in communicating its policy decisions to the public. In particular, I illustrate the difficulties of disseminating the essence of complex internal economic analysis.

My study demonstrates that the Swiss approach to monetary targeting rested on a coherent analytical framework, assigning a key role to money as a target variable and policy indicator. BERNANKE and MIHOV (1997) assess critically monetary targeting of the Bundesbank and claim that the German central bank's approach was little more than inflation targeting in disguise. According to their analysis, the Bundesbank reacted directly to its inflation objective, rather than to its monetary target, when it altered interest rates. In the following, I do not address Bernanke and Mihov's critique of the Bundesbank. However, so far as

Switzerland is concerned, there are both similarities and differences between the monetary targeting strategies followed until 1999 and the current approach based on inflation forecasts. I will return to this issue at the end of my paper.

I do not regard my study as a rigorous historical analysis of Swiss monetary targeting. Such an analysis will not be feasible so long as the SNB's internal records remain closed to the public.⁴ Therefore, the following analysis is based on my recollections as a SNB researcher from 1977 to 1985 and the SNB's chief economist from 1985 to 2001, and on numerous discussions with Kurt Schiltknecht, who not only served as chief economist until 1985 but was also instrumental in introducing monetary targeting to Switzerland. In addition, I rely on a variety of documents published by the SNB in order to communicate and justify its policy decisions to the public. Three categories of publications are particularly relevant:

- *Annual policy statement of the SNB*: This statement was normally presented at a press conference in December and summarised the SNB's policy plans for the following year. It was subsequently published, until the end of 1983 in SNB, *Monatsbericht* (henceforth *MB*)⁵ and thereafter in SNB, *Geld, Währung und Konjunktur* (henceforth *QB*).⁶
- *Address by the president of the SNB to the annual meeting of shareholders*:⁷ In this address, the SNB-president reviewed and still reviews monetary policy and the economic situation, and discusses other relevant topics (published as an insert to *MB* until 1983, thereafter in the June issue of *QB*).
- *Annual Report of the SNB* (henceforth *AR*): The Annual Report is used by the SNB to explain its monetary strategies and policies, and to account for its policy actions (available in German and French, from 1982 onwards also in English).

Besides these publications, speeches delivered by the three members of the SNB's Governing Board and other top officials frequently offer supplementary

4 Normally, the SNB will open its internal records only after 30 years.

5 The SNB published the annual policy statements in German and French, from 1989 onwards also in English and Italian. If English translations of the SNB's publications are unavailable, I cite the German version. *MB* is now called *Monthly Statistical Bulletin*.

6 *QB* is now called *Quarterly Bulletin* (available in English since September 2002).

7 The SNB is structured as a public corporation listed on the Zurich stock exchange, but governed by a special law providing only limited powers to shareholders. In particular, the federal government appoints the top officials of the SNB, notably the three members of the Governing Board, the SNB's policy making body.

information on Swiss monetary policy. Nevertheless, I largely restrict myself to the publications listed above. The policy pronouncements contained in these publications are approved by the Governing Board and, therefore, present the official views of the SNB.

Under monetary targeting, the SNB relied on the following procedure for setting monetary policy. In the autumn, the economic staff prepared its proposals for the policy course to be pursued in the following year and for the monetary target to be fixed. At a meeting normally held in November, the Governing Board discussed the economic staff's proposals, with representatives from the operational and press departments of the SNB also participating in the debate. After the Governing Board had decided about the prospective course, it prepared, in close collaboration with the press department and the economic staff, the policy statement to be distributed to the public. The SNB-president in turn announced the intended policy course at the December press conference already mentioned above. During the year, the Governing Board regularly reviewed its monetary policy. At a minimum, these reviews took place each quarter on the basis of a quarterly report written by the economic staff. While the economic staff played an important advisory role, it was the Governing Board that ultimately took the policy decisions and the responsibility for the SNB's actions.

Of course, some readers may ask what insights will be gained from a study of Swiss monetary targeting. After all, monetary targeting has gone out of fashion, even in Switzerland. Nevertheless, Swiss experience offers at least two important lessons that may continue to remain pertinent in a world dominated by inflation targeting.

First, various central banks still pay considerable attention to money. Although the SNB no longer relies on monetary targets, it continues to stress the importance of monetary aggregates, notably of the money stock M3, as they provide useful information on the future development of inflation, especially on the evolution of inflation in the longer run. In the two-pillar strategy of the European Central Bank, money also plays an important role. Therefore, the questions of how to use monetary aggregates as a policy guide and of how to extract relevant information on future inflation from money remain of great concern to many central banks. Swiss experience shows that the SNB at first underestimated the difficulties of extracting reliable policy signals from the monetary aggregates. These signal-extraction problems also bore on the SNB's external communication efforts. In principle, the SNB's public pronouncements closely matched its policy deeds. Occasionally, though, the clarity of its pronouncements left something to be desired. The inadequacies in the SNB's external communication invariably reflected the difficulties of disseminating to the public complex

policy decisions involving a great deal of uncertainty about the effects of the SNB's planned actions.

Second, the SNB has acquired strong credibility as a central bank committed to preserving price stability. The SNB's credibility probably explains why Swiss interest rates – both in nominal and real terms – tend to be lower than in any other European country. I am not sure whether I can explain fully the SNB's strong credibility. Nevertheless, my study identifies several factors that are likely to have fostered credibility: The SNB always endeavoured to disclose to the public its policy objectives, as well as the measures it would take to achieve these objectives. Moreover, the SNB accepted full responsibility for price developments, especially when inflation returned temporarily in 1980/81 and 1989/90. It admitted that it was mainly to blame for these lapses from the path of virtue. It also promised to make every effort to restore price stability again.

The remainder of the paper is structured as follows. Section 2 covers the initial period of monetary targeting and shows how the SNB determined and communicated its growth targets for M1. In Section 3, I analyse the brief interlude of exchange rate targeting and the return to an approach centred on money growth. Sections 4 and 5 review the SNB's experience with targets for the monetary base, that is, with the annual growth targets fixed until the end of 1989 and with the medium-term approach adopted thereafter. The study ends with the year 1996, when the late Markus Lusser retired as president of the SNB. Section 6 offers a summary and conclusions.

2. The Inception of Monetary Targeting: 1974–1978

At the end of 1974, the SNB – along with the German Bundesbank – decided to adopt monetary targeting. Contrary to the advice of leading monetarists, the SNB chose a flexible targeting approach that did not severely constrain its scope for discretion. It argued that a rigid monetarist framework would be unsuitable for a small open economy, strongly exposed to external shocks. The floating exchange rate of the Swiss franc, in particular, caused considerable headaches to Swiss policy makers. Its behaviour frequently defied economic fundamentals, as President Stopper noted at the SNB's annual meeting of 1974. For this reason, the SNB preferred a targeting framework that would allow for variations in M1 growth between 3 and 7 percent per year, depending on the level of the exchange rate. This range of variation was consistent with the observation that in the low-inflation environment of the 1950s and early 1960s, M1 growth had averaged roughly 5 percent (SCHILTKNECHT, 1977, pp. 4–7). In other words, the

SNB opted for a *state-contingent* monetary target, with the exchange rate serving as a crucial state variable to be considered in setting monetary policy. Subsequently, time and again, the SNB emphasised the state-contingent nature of its targeting approach.

Since inflation was still running at about 10 percent per year, the SNB was willing to set a relatively generous growth target for M1. It intended to fight inflation gradually and to avoid undue disruptions in the real economy. It chose a target of 6 percent for 1975 (Table 1), implying that M1 growth would lie in the upper part of the desirable range of 3–7 percent.⁸ To derive its target, the SNB departed from a forecast of movements in demand for M1 on the assumption that interest rates would remain unchanged. To this end, the SNB relied on the available econometric estimates of money demand. Furthermore, it needed forecasts of two other important determinants of money demand, that is, inflation and real output growth. The forecasts of inflation and output growth underlying the SNB's analysis are shown in Table 2.

Considering the long policy lags, the SNB assumed that its actions to be taken in 1975 would not exert more than a negligible effect on output growth and inflation in the same year. Thus, output growth and inflation in 1975 could be treated as exogenous variables. However, as time went on, the policy measures taken in 1975 would impinge on output growth and inflation. The SNB also assumed that in the long run, money growth would be neutral and influence exclusively the inflation rate. In the short run, however, changes in monetary policy would also affect output and employment, though only temporarily. On these assumptions, demand for M1 was expected to rise by close to 8 percent. Since forecasts of money demand remained an important feature of the SNB's analysis, I will henceforth speak of an "activity-induced change in money demand" in order to describe a demand change induced by a movement in real output and prices at given interest rates. Considering its preference for a gradual reduction in money growth, the SNB thought a target for M1 of 6 percent to be a reasonable proposal.⁹

8 The SNB always fixed point targets. Considering the state-contingent nature of its targets, the SNB was concerned that a target range would mislead the public into believing that the Swiss central bank possessed ample knowledge about the contingencies likely to afflict monetary policy (SCHILTKNECHT, 1983, p. 73).

9 The SNB also used another method for determining the target by relying on the quantity equation of money, that is, $MV=PY$, where M denotes the money supply M1, V velocity, P the GNP deflator and Y real GNP respectively. The target for the growth in M1 was derived by inserting forecasts for the rates of change in P and Y, as well as in the velocity of M1 expected to occur in 1975. This method yielded a somewhat lower forecast of the increase in M1.

Table 1: Annual Monetary Targets of the SNB

Target for	Target Variable	Target (%) [#]	Outcome (%) [#]	Comments
1975	M1*	6	4.4	Also subsidiary monetary-base target
1976	M1*	6	7.7	Also subsidiary monetary-base target
1977	M1*	5	5.5	
1978	M1*	5	16.2	
1979	–	–	–	Temporary exchange rate target
1980	MBA	4	–0.6 –2.0	Average of annualised monthly rates of change over November 1979 level November 1980 over November 1979
1981	MBA	4	–0.5	
1982	MBA	3	2.6	
1983	MBA	3	3.6	
1984	MBA	3	2.5	
1985	MBA	3	2.2	
1986	MBA	2	2.0	
1987	MBA	2	2.9	
1988	MBA	3	–3.9	
1989	MBSA	2	–1.9	Average of annualised monthly rates of change over the level in the fourth quarter of 1988
1990	MBSA	2	–2.6	Rate of change in the fourth-quarter level over the corresponding level in the preceding year

* M1 according to the definition of 1975. In 1985 the M1 data were adjusted to include new types of transactions accounts bearing a somewhat higher rate of interest than traditional demand deposits.

Unless otherwise indicated in the “Comments” column, the target and the outcome represent annual averages of year-on-year monthly rates of change.

Source: RICH (1997, p. 116), with slight modifications.

Table 2: SNB-Forecasts of Inflation and Output Growth

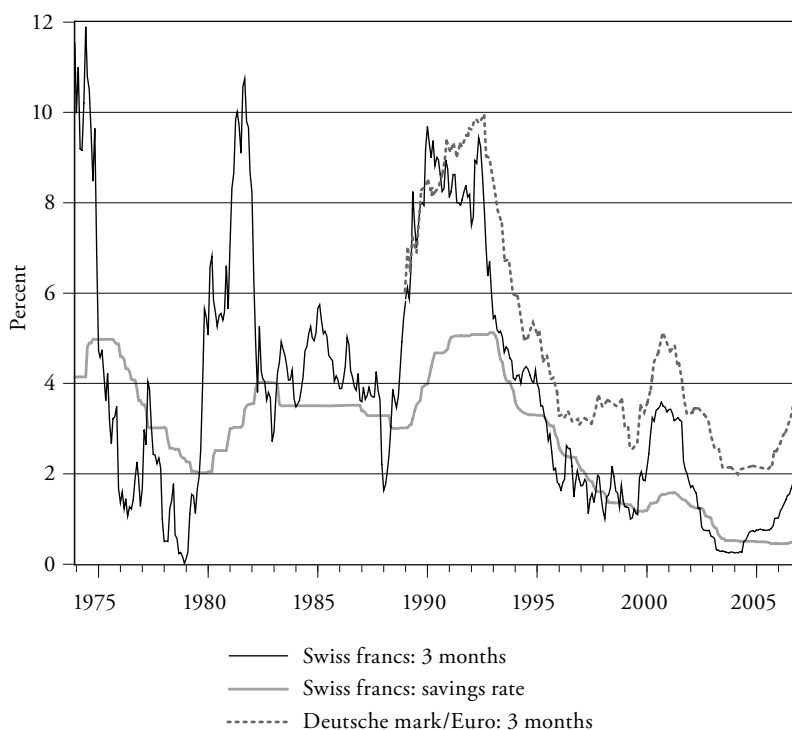
As of end of	Forecast for year	Published	CPI Inflation* (%)		Growth, real GNP/GDP* (%)	
			Forecast	Effective	Forecast	Effective
1974	1975	No	7.5	6.7	0	-7.5
1975	1976	No	3.8**	1.7	1	-0.6
1976	1977	No	—***	1.3	—***	2.8
1977	1978	No	—***	1.0	—***	0.4
1978	1979		—***	3.6	—***	2.8
1979	1980	No	—***	4.0	—***	4.2
1980	1981	No	3–4	6.4	0	2.4
1981	1982	No	4–5	5.7	1–2	-0.9
1982	1983	No	3–4	3.0	-1	1.4
1983	1984	No	2.6**	2.9	1.7	3.0
1984	1985	Yes	2.5	3.4	Less than 2	3.7
1985	1986	No	2	0.8	2.4	2.9
1986	1987	Yes	Less than 2	1.4	More than 2	2.0
1987	1988	Yes	2	1.9	More than 1	2.9
1988	1989	Yes	3	3.2	2	3.9
1989	1990	Yes	No less than 3	5.9	More than 2	1.9
1990	1991	Yes	4	5.3	0	-1.9
1991	1992	Yes	3–4	3.4	1	-0.9
1992	1993	Yes	2.5	2.7	0	0.5
1993	1994	Yes	2	0.9	Just over 1	0.5
1994	1995	Yes	Just under 3	1.8	2	0.5
1995	1996	Yes	1.5	0.8	1.5	0.3

* 1975–80: GNP at 1970 prices, 1981–84: GNP at 1980 prices, 1985–90: GDP at 1980 prices, 1991–96: GDP at 1990 prices. For prices and output, the forecasts pertain to the percentage changes in annual averages, except for the years 1990–1993, for which the SNB forecasted the change from the fourth quarter of the current to the fourth quarter of the subsequent year. For 1994 onwards, the SNB provided forecasts for both the average and the fourth-quarter to fourth-quarter changes.

** GNP-Deflator.

*** Forecast of growth in nominal final demand. For simplicity, the forecasts for nominal final demand are not indicated in the table because they cannot be compared to the data on actual GNP growth. No forecast was established for 1979.

Figure 2: Interest Rates on Euro-Swiss-Franc and Euro-Deutsche-Mark (Euro) Deposits, and Domestic Savings Deposit Rate



From the growth target for M1, the SNB derived the subsidiary target for the monetary base by forecasting the multiplier linking the two monetary aggregates.¹⁰ It came to the conclusion that the monetary base would be likely to rise at about the same rate as the aggregate M1. Finally, from the forecast of base-money growth, the SNB established an operational target for bank reserves, that is, the banks' deposits with the SNB. The Swiss central bank preferred to operate on bank reserves, rather than on short-term interest rates, in order to manage money growth. By operating on bank reserves, both the SNB and market participants could elicit the changes in interest rates required to achieve the monetary target.

10 See BÜTTLER et al. (1979) and SCHILTKNECHT (1983) for the money-multiplier model employed by the SNB.

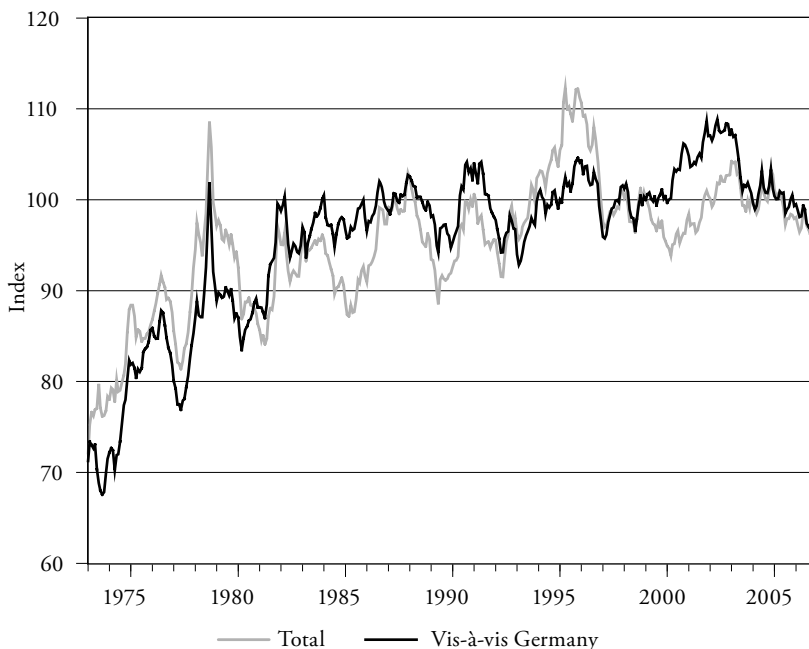
In principle, the SNB was able to control the monetary base with a reasonable degree of precision. Until the introduction of a new electronic interbank payments system in the late 1980s (see Section 4.2), bank reserves were negatively related to short-term interest rates (RICH and BÉGUELIN, 1985, p. 92). To increase the monetary base, the SNB supplied additional reserves to the banks. This prompted a fall in short-term interest rates, inducing the banks to absorb the additional base money. After several months, the lower interest rates began to stimulate demand for bank notes, notably demand for the large denominations. The lagged response in the circulation of large-denomination bank notes to changes in interest rates can still be observed today. It derives from the fact that note demand reacts to changes in interest rates on savings deposits, which in turn adjust sluggishly to variations in short-term interest rates.¹¹ The relationship between the interest rate on three-month time and on savings deposits is shown in Fig. 2.

In its press release of December 1974 (*MB*, Jan. 1975, p. 3), the SNB announced its intention to increase the monetary base by 6 percent the following year. On the assumption of an unchanged money multiplier, the aggregate M1 would rise by a similar order of magnitude. The wording of the press release implied that the SNB was about to fix multiple targets. It did not explicitly state that the objective for the monetary base only played a subsidiary role. However, in the *AR* for 1975 the SNB made clear that the primary target referred to M1. In its policy announcement for 1976, the SNB again mentioned a target for the monetary base, but in subsequent press releases it dropped any reference to this aggregate.

The economic developments of 1975 confirmed the virtues of monetary targeting. As may be seen from Table 2, the SNB correctly predicted a further decline in the inflation rate, but its forecast of output growth was far off the mark. The oil price shock, combined with the SNB's restrictive monetary policy, caused output to drop by 7.5 percent in 1975, by far the sharpest decline recorded after World War II. Due to the severe recession, the expected activity-induced increase in money demand did not materialise. To keep M1 growth on track, the SNB was compelled to boost bank reserves and the monetary base, resulting in a sharp drop in interest rates (Fig. 2). While M1 growth fell somewhat short of the target (Table 1), the monetary base expanded by 10 percent. Thus, the monetary target helped to counteract the cyclical contraction in output.

11 See SCHILTKNECHT (1974) and ETTLIN (1989) for econometric studies of the demand for bank notes. For various reasons, Swiss large-denomination bank notes, which account for over half of the aggregate note circulation, play an important role as a store of value.

Figure 3: Real Exchange Rate of the Swiss Franc



A major concern of the SNB was a sharp nominal and real appreciation of the Swiss franc after the switch to a flexible exchange rate (Fig. 3). The president's speech at the 1975 annual meeting and the *AR* for 1975 both addressed this concern. The SNB felt it was waging a war on two fronts. On the one hand, it tried to curb the rise in the exchange rate through elaborate controls on inflows of foreign capital and through extensive interventions on the foreign exchange market. On the other hand, it was determined to reduce inflation through a controlled expansion in the money supply. Of course, as the SNB had discovered earlier, a controlled expansion in the money supply was inconsistent with unlimited purchases of foreign currencies against Swiss francs. The SNB resolved this conflict by according priority to the monetary target. It treated the planned expansion in the monetary base as the ceiling on its purchases of foreign currencies. In its *AR* for 1975 the SNB provided a detailed review of its attempts to slow the Swiss franc's appreciation and of its efforts to boost base-money growth. It also stressed the state-contingent nature of its monetary target.

During following three years, the SNB continued to employ the analytical procedure established at the end of 1974, except that it relied on forecasts for growth in nominal final demand (defined as GNP plus imports), rather than for output growth and inflation (Table 2). Final demand was considered to be a better predictor of activity-induced changes in M1 demand than real GNP and prices. At the end of 1975, SNB decided to keep the targets for M1 and base-money growth unchanged at 6 percent. However, in its press release of December 1975 (*MB*, Jan. 1976, p. 3), the SNB explicitly pointed out that money growth would not only depend on the target but also on the state of the economy. Expecting a modest recovery of the Swiss economy, the SNB emphasised that it would not hesitate to tighten monetary policy, should the strength of the recovery exceed expectations.¹² Furthermore, it would not buy foreign exchange beyond the limits imposed by the monetary target. At the end of 1976, the SNB reduced the growth target for M1 to 5 percent. Even though by the summer of 1976 inflation had fallen to very low levels, the SNB still undertook to keep money growth in the middle of the desirable range in order to discourage a further appreciation of the Swiss franc on the foreign exchange market (*MB*, Dec. 1976, p. 3).

As indicated by Table 1, the SNB largely met its targets, except in 1978, for reasons to be discussed in Section 3. In its *AR* for 1977 (pp. 10–11), the SNB portrayed its monetary policy concept. After describing key monetarist principles, the SNB argued that monetarists had developed these principles for large closed economies. Therefore, they were not applicable to Switzerland without major modifications. The Swiss concept entailed a medium-run approach to monetary targeting with two aims: Achieving and maintaining price stability, and stabilising the real economy through a strategy of steady money growth. In managing the money supply, the SNB was prepared to react flexibly to developments on the foreign exchange market in order to curb undesirable movements in the Swiss franc exchange rate.

Consequently, the SNB in the late 1970s developed a coherent and transparent policy framework based on monetary targeting. Nevertheless, the internal policy analysis, though playing a crucial role in setting monetary targets, suffered from several flaws. First, it was unclear whether the SNB's emphasis on steady money growth¹³ was in sympathy with the call for a state-contingent target. As I show below, its strategy of steady money growth prevented the SNB from adopting a

12 This statement was consistent with its forecast (Table 2).

13 The SNB repeatedly praised the virtues of steady money growth (in German: “*Verstetigung des Geldmengenwachstums*”). See its *AR* for 1979 (p. 10) and President Leutwiler's address to the annual meeting of 1981.

sufficiently pre-emptive policy approach in the face of unexpected shocks threatening to jeopardise price stability.¹⁴ Although the SNB managed to lower significantly the inflation trend, it invariably failed to quell a temporary acceleration of inflation during business-cycle expansions.

Second, the forecasts of activity-induced changes in money demand were marred by two problems. In fixing its monetary targets, the SNB was ambivalent about the role played by its inflation objective and potential output. The SNB neither announced an explicit inflation objective nor did it make clear whether its monetary target pertained to potential or actual output growth. In its official publications at least after 1976 (*MB*, Dec. 1977, p. 3), the SNB stressed that potential output mattered, but its internal analysis only featured actual growth. Moreover, the analysis underlying the monetary targets disregarded expected movements in interest rates. In principle, the targets matched the anticipated activity-induced change in money demand. This procedure implied that once the targets had been fixed, interest rates would remain unchanged provided the SNB's macroeconomic forecasts materialised. Therefore, the internal analysis ignored an important issue. If the SNB merely adapted the money supply to the expected activity-induced change in demand, it would not be able to achieve price stability. To lower inflation, the SNB had to push up interest rates, that is, it could not fully accommodate the expected activity-induced change in demand.

3. Exchange Rate Targeting and the Return to Money: 1978–1981

3.1 *Temporary Target for the Exchange Rate*

In the middle of 1977 the real exchange rate of the Swiss franc began to rise again after the earlier appreciation had been partly reversed the previous year (Fig. 3). The SNB and the public were both concerned about the renewed upsurge of the exchange rate. Therefore, towards the end of 1977, the SNB began to intervene heavily on the foreign exchange market. The interventions led to a substantial increase in the monetary base and the aggregate M1. In the spring of 1978 the SNB realised that it would overshoot its monetary target by a wide margin. To avoid a serious target miss, it cautiously began to remove excess liquidity from

14 Monetarists today admit that steady money growth need not be an optimum strategy (see MELTZER, 1998).

the money market.¹⁵ The SNB's action convinced market participants that the Swiss central bank would remain loyal to its monetarist beliefs. As a result, they descended on the foreign exchange market with a vengeance and pushed up the exchange rate of the Swiss franc to levels never seen before. The spectre of a drastic slump in economic activity forced the SNB to react.¹⁶ In September 1978, the SNB contemplated introducing an exchange rate target zone for the Swiss-franc price of the DM. The idea was to conduct non-sterilised purchases of foreign currencies until the exchange rate had reached the lower bound of the target zone. Once the situation on the foreign exchange market had calmed down, the SNB should remove again the overhang of base money that was bound to result from these interventions. However, the SNB did not adopt a target zone. Instead, at the beginning of October 1978, it announced that it would fix a temporary exchange rate target with the aim of keeping the Swiss-franc price of the DM "clearly" above 80.¹⁷

The interventions required for defending the exchange rate target led to an explosive expansion in the monetary base and the aggregate M1. Not surprisingly, the SNB exceeded the target for 1978 by over 10 percentage points. Thanks to the policy shift, the Swiss franc began to depreciate again to more realistic levels.¹⁸ At the end of 1978, the SNB did not fix a monetary target for the following year because it was uncertain about the future development of the monetary aggregates. In its press release of December 1978 (*MB*, Jan. 1979, p. 3), the SNB stated that it was willing to tolerate the monetary expansion resulting from the exchange rate target. However, in the medium term, its aim was to return to monetary targeting. At the beginning of 1979, the SNB started to reduce the monetary base again.

15 The movements in base-money growth in 1978 reflected the SNB's actions (Fig. 1). See the *AR* for 1978 (pp. 8–13) for a more detailed description of the SNB's measures.

16 The SNB was under enormous pressure from the export sector, the federal government and the general public to halt the upsurge of the Swiss franc. The government threatened to introduce a dual foreign exchange market, under which it would have applied a fixed exchange rate to most current-account transactions and a floating exchange rate to all the other balance-of-payments flows. This was an anathema to the liberally-minded Swiss central bank. In his speech at the 1976 annual meeting, President Leutwiler had already discussed the drawbacks of a dual foreign exchange market.

17 The target zone considered by the SNB was 84 to 100 CHF/100DEM. A more detailed discussion of the 1978 policy switch is provided by BERNHOLZ (2007, pp. 179–181), who had access to such internal SNB documents as the minutes of the Governing Board.

18 In November 1978, US monetary authorities decided to take measures to fight inflation and to strengthen the dollar. This also contributed to weakening the Swiss franc.

3.2 *Annual Target for the Monetary Base*

At the end of 1979, the SNB was ready to reintroduce a monetary target. It was convinced that the overhang had been completely eliminated, both in terms of the monetary base and M1, an assessment confirmed by subsequent research (KUGLER and RICH, 2002). However, the SNB decided to simplify its targeting approach. It bypassed the aggregate M1 and elevated the subsidiary objective for the monetary base to the position of key target variable.

Treating the monetary base as the key target variable raised two tricky problems. The first one was related to the fact that the SNB had always defined its target as an annual average of monthly year-on-year rates of change.¹⁹ Since the monetary base had fallen drastically in the first months of 1979, the year-on-year rates of change were bound to be strongly negative in the early part of 1980. Therefore, the target likely to be set by the SNB would also be negative. It would be hard to explain to the public why the SNB saw a need for fixing a negative target. A second problem stemmed from the available data on the monetary base. Swiss bank reserves were characterised by massive month-end bulges.²⁰ The monetary base could not be used as a sensible target variable unless the data were adjusted for these bulges. Unfortunately, satisfactory data on the monetary base – adjusted in this way – did not exist upon the target switch, as the SNB did not start to publish such a series until 1981. From the end of 1980 onwards, the target referred to the adjusted monetary base (MBA), which excluded the month-end bulges in bank reserves.

Considering these difficulties, the SNB decided to increase the monetary base by 4 percent from the middle of November 1979 to the middle of November 1980. It determined the target indirectly by deriving first an implicit objective for M1. In its press release of December 1979 (*AR* for 1979, p. 10), the SNB announced its new monetary-base target of 4 percent and pointed out that M1 would largely remain unchanged. However, it failed to mention that the base target would rest on November 1979 as a starting point, while the increase in M1 was calculated from year-on-year rates of change. Moreover, the public was unaware that the target would refer to provisional internal data on MBA, rather than to the published unadjusted series. This was one among very few instances in which the press release omitted information that was crucial for understanding the SNB's planned policy action. Table 1 shows that the SNB in 1980 did

19 The SNB used year-on-year growth rates as a method of seasonal adjustment.

20 They resulted from minimum reserve requirements that were enforced only at month ends and window-dressing activities.

not increase MBA as it had anticipated.²¹ Two factors explain the target miss. First, inflation, fuelled by the second oil price shock, was on the rise again, compelling the SNB to pursue a more restrictive course than initially intended. Second, the demand for bank notes declined unexpectedly. This demand shift was related to the fact that the SNB at the beginning of 1980 had lifted all the remaining restrictions on inflows of foreign capital. Apparently, foreign investors had circumvented these restrictions by acquiring Swiss bank notes (*AR* for 1979, pp. 7–9).

For 1981 the SNB again fixed a growth target for MBA of 4 percent. In its press release of December 1980, the SNB stated that the target of 4 percent was a bit higher than was warranted in the medium term (*AR* for 1980, p. 9). It justified the relatively generous target by the uncertain prospects of the world economy. As in the preceding year, the SNB soon realised that its intended course was too easy. In his address to the annual meeting of April 1981, President Leutwiler admitted that the SNB should have fixed a lower target as it had underestimated the inflationary pressures in the Swiss economy. He attributed the rise in inflation mainly to the monetary policy the SNB had pursued late in 1978 and to an excessive depreciation of the Swiss franc. Therefore, the SNB had decided to tighten monetary policy and to undershoot the target. Since the SNB failed to halt the drop in the value of the Swiss franc, the SNB in the autumn of 1981 tightened its reins once more. As a result, interest rates rose sharply (Fig. 2). While it now succeeded in reversing the decline in the exchange rate (Fig. 3), it could not help accepting another substantial target miss (Table 1), which reflected mainly the switch to a more restrictive course, rather than renewed instabilities in money demand. As may be seen from Table 2, the SNB underestimated significantly both inflation and output growth for 1981.

The events of 1978–1981 influenced strongly the SNB's attitudes about the exchange rate. Many SNB-officials were led to conclude that central banks endeavouring to halt and reverse an excessive appreciation of the domestic currency would be penalised by a subsequent surge in inflation. President Leutwiler, after his retirement from the SNB in 1985, went as far as to assert that the shift to an exchange rate target had been a big mistake (SCHILTKNECHT, 1989, p. 253). In my view, Leutwiler's harsh verdict is untenable. In principle, the SNB

21 I used two methods of calculating the effective increase in the monetary base. These calculations rely on the data for MBA that the SNB began to publish in 1981. Interestingly, the SNB in its *AR* for 1980 (p. 8) did not provide a figure for the effective increase in the monetary base. It merely stated that the increase in the monetary base had been below target.

was well advised to ease monetary policy in response to a massive appreciation of the Swiss franc that raised the spectre of a slump in economic activity and deflation. Why did the temporary shift to an expansionary stance, though fundamentally correct, re-ignite inflation? Existing studies offer two possible answers to this question.

First, SCHILTKNECHT (1989) argues that the SNB was too tardy in eliminating the monetary overhang created by the interventions of late 1978 and thus allowed the inflationary forces to take root again. Second, KUGLER and RICH (2002) point to the flaws in the SNB's strategy of steady money growth as another possible source of inflation. The SNB may have failed to adopt a sufficiently pre-emptive restrictive stance when the economy embarked on a cyclical expansion in 1979. Kugler and Rich test empirically these two explanations for the SNB's failure of containing inflation. They conclude that both factors account for the surge of inflation early in the 1980s. The SNB should have reduced M1 more decisively in 1979 and pursued a much tighter course in 1980 than it actually did.

The SNB believed that a target for the monetary base would help mitigating undesirable movements in the exchange rate such as had occurred in 1978. Its internal analysis was strongly coloured by the then popular literature on currency substitution. The SNB assumed that market expectations of a strong appreciation of the Swiss franc had prompted investors to substitute domestic for foreign money. In its view, the demand for the aggregate M1 was particularly vulnerable to currency substitution. In 1978, the expectation of a stronger Swiss franc had prompted the public to demand additional Swiss money in the form of M1. Had the SNB failed to accommodate the rise in demand for M1, it would have pushed up short-term interest rates and magnified the currency appreciation. By targeting the monetary base, the SNB would allow the supply of M1 to respond to shifts in exchange rate expectations and thus to play a stabilising role. However, the SNB's internal analysis was flawed. Although actual demand for M1 seemed to exceed the estimated values in 1978, subsequent research by the SNB failed to uncover any statistically significant evidence of currency substitution.²²

Since there was little evidence of exchange rate expectations affecting directly the demand for M1, the SNB's decision of adopting a target for the monetary base rested on shaky foundations. Nevertheless, the switch to a base target was sensible for other reasons. The demand for M1 tends to be more sensitive to changes in

22 The SNB never published this research. It was aware of MCKINNON's (1982; 1984) distinction between direct and indirect currency substitution. It focused entirely on direct currency substitution (see KUGLER and RICH, 2002).

interest rates than the demand for base money. As I show below, a monetary target helps stabilising cyclical fluctuations in inflation and output provided demand for the targeted aggregate is not too sensitive to changes in interest rates.²³ Furthermore, demand for M1 became temporarily unstable (BELONGIA, 1988), due to the introduction of new types of transaction accounts. These instabilities disappeared again when the SNB adjusted the M1 series for these innovations.

In other respects, the events of the late 1970s had a salutatory effect on the SNB. Reviewing the exchange rate policies it had pursued in the 1970s, the SNB concluded that sterilised interventions on the foreign exchange market were useless in managing the exchange rate (SCHILTKNECHT, 1983). The SNB could not really affect the exchange rate unless it was willing to change monetary policy.²⁴ However, in aiming monetary policy at the exchange rate, the SNB had to exercise caution because of possible conflicts between its overriding objective of price stability and the desire for a stable exchange rate. Moreover, the SNB lost its faith in the effectiveness of capital controls in influencing the exchange rate. From the early 1980s onwards, sterilised interventions became rare events indeed and capital controls were never used again.

4. The Quiet before the Storm, 1982–1990

4.1 *Quiet Period up to the Middle of 1987*

The period from 1982 to the summer of 1987 did not feature major challenges to monetary policy makers. The renewed decline in inflation after 1981 was preceded by a cyclical contraction, starting in the summer of 1981 and lasting until the end of 1983. As a result of a strong recovery in the United States, the Swiss economy began to pick up again in 1984. Aside from a temporary slowdown in real growth in 1987, the cyclical expansion continued until 1989. Inflation declined from over 7 percent in 1981 to about 3 percent in 1982. However, the SNB did not succeed in reducing inflation further to the range that it defined as price stability (see below). Even in the second half of the 1980s, the inflation trend never fell below 2 percent, for reasons to be discussed later.

During this period, the SNB completed and refined the analytical framework developed for establishing its monetary policy. In particular, it fixed some of the

23 BENJAMIN FRIEDMAN (1977) had already discussed the consequences of interest-elastic money demand for monetary targeting.

24 President Leutwiler stressed these points in his address to the 1984 annual meeting.

flaws mentioned at the end of Section 2. From the end of 1982 onwards, it relied on a four-step procedure for determining the monetary target to be set for the following year. The first step involved establishing a benchmark for the growth in the monetary base. The benchmark equalled the average annual rate of growth in the monetary base that the SNB thought to be consistent with potential output growth and its “objective” of low inflation. The second step embraced the forecast of the activity-induced change in the demand for base money for the following year, that is, the procedure developed in the 1970s. However, in contrast to its earlier approach, the SNB now undertook to forecast base-money demand directly, rather than indirectly by way of the aggregate M1. In a third step, the SNB determined the target to be set for the following year. In determining the annual target, the SNB compared the expected activity-induced change in base-money demand with the benchmark. In particular, it explored the question of whether the annual target should differ from the benchmark. The fourth step entailed a *conditional* forecast of the movements in interest rates likely to be elicited by the policy course planned for the following year. If the expected activity-induced change in the demand for base money did not match the annual target, interest rates were bound to adjust in order to keep the growth in demand in line with the target. The forecast of interest rates, of course, was conditional on the SNB’s forecast of output growth and inflation. If the macroeconomic forecasts did not materialise, movements in interest rates would also deviate from the SNB’s original expectations.

As monetarists had often emphasised, a monetary target providing for steady growth in the money supply was likely to trigger interest rate movements designed to smooth cyclical fluctuations in inflation and output, besides keeping the inflation trend at low levels. Suppose that the Swiss economy suffered from a cyclical contraction, with output expected to fall the following year. Because of the expected drop in nominal income, the activity-induced demand for base money, in all probability, would decrease too. Suppose further that the SNB planned to increase the supply of base money by 2 percent in accordance with its benchmark. Considering the expected gap between supply and demand for base money, the SNB had to allow interest rates to fall in order to keep the money market in equilibrium. If the drop in output turned out to be more severe than expected, interest rates would also have to decline more strongly than the SNB had initially anticipated. Thus, the monetary target elicited stabilising movements in interest rates designed to raise output.

In principle, the SNB’s internal policy debate was structured along the lines of this analytical framework. However, in applying the framework to concrete policy decisions, the SNB faced a number of obstacles. They involved determining an

appropriate benchmark, establishing and interpreting the forecasts of activity-induced changes in money demand, and the continuing problem of dealing with the exchange rate. A further issue concerned the question of how best to communicate to the public the economic analysis underlying the SNB's policy decisions.

As regards the benchmark, the SNB in the early 1980s considered an average increase in MBA and M1 of 2–3 percent per year to be consistent with price stability and potential output growth. At first, the benchmark did not rest on rigorous analysis. The SNB merely conjectured that potential output would grow by about 2 percent per year. Moreover, it assumed an inflation “objective” of 0–1 percent per year. This yielded an annual increase in nominal potential output of 2–3 percent. Drawing on the then available econometric research, the SNB postulated a unitary long-run elasticity of demand for MBA and M1 with respect to output and the price level.²⁵ In 1986, the SNB investigated thoroughly the evolution of potential output. It concluded that its earlier assumption had been realistic.²⁶ Later reviews of its estimates did not yield significantly different results.

While the SNB was reasonably certain about potential output growth, it was less sure about the trend in the income velocity of money. As time went on, it realised that the income velocity of the monetary base followed an upward trend, as its models tended to overestimate the activity-induced increase in the demand for base money. Therefore, the SNB gradually reduced the benchmark to 2 percent. In debating the policy course to be pursued in 1988, the SNB noticed that over the period 1980–1986, average annual growth in real GDP had matched closely the potential of 2 percent, while the increase in MBA had averaged only 1.7 percent. In these circumstances, inflation would have dropped to about zero percent had the income velocity remained constant. Since the CPI still tended to rise by roughly 2 percent per year, this implied an upward trend in velocity of the same order of magnitude, reflecting the declining importance of cash as a means of payment. Thus, even a benchmark of 2 percent was still too high. With

25 See SCHILTKNECHT (1974) and VITAL (1978) for the then available econometric studies of demand for M1. The SNB also assumed a constant long-run multiplier of M1 with respect to MBA. At the end of 1982, the SNB ceased to derive the target for the monetary base by way of M1 because the multiplier model no longer provided reliable forecasts. Moreover, as indicated above, the aggregate M1 became temporarily unstable. Instead, the SNB directly estimated the income elasticity of MBA and its components (RICH and BÉGUELIN, 1985; KOHLI, 1985, and ETTLIN, 1989).

26 This research was later published (BÜTTLER, ETTLIN and RUOSS, 1987) and yielded an estimate of potential output growth of 1.8–1.9 percent per year.

an annual trend increase in velocity of 2 percent and nominal potential output growth of 2–3 percent, a benchmark of about 1 percent would have been more appropriate. As a matter of fact, the SNB reduced its benchmark to 1 percent upon the switch to the medium-term targeting approach at the end of 1990. Its tendency to overestimate the benchmark explains why the SNB did not succeed in lowering trend inflation below 2 percent in the course of the 1980s.

The policy announcements were coloured by the difficulties of determining an appropriate benchmark. In its press release of December 1982, the SNB disclosed for the first time a benchmark of 2–3 percent for the growth in the monetary base. At the end of 1984, it reduced the benchmark to 2–2.5 percent and a year later to 2 percent (*MB*, Dec. 1982, p. 3, *QB*, Dec. 1984, p. 7, and Dec. 1985, p. 247). In contrast to publishing a benchmark, the SNB was reluctant to quantify its definition of price stability. At the 1984 annual meeting, President Leutwiler defined price stability as a rate of increase in the CPI of *close to zero* (italics mine). Because of the uncertainties about the official definition of price stability, the SNB had to resort to somewhat opaque language to explain the assumptions underlying the benchmark. At the end of 1985, it stated that MBA growth of 2 percent was consistent with potential output growth of about 2 percent in real terms and slightly more than 2 percent in nominal terms, given its assumption about the inflation trend (*QB*, Dec. 1985, p. 247). Only in its *AR* for 1986 (p. 7), did the SNB decide to clarify this issue and to quantify its definition of price stability.²⁷

By contrast, the derivation of the annual monetary targets, for the most part, did not raise major difficulties. Until 1985, the SNB kept the annual targets somewhat above the benchmark because of its stated aim to reduce inflation gradually (Table 1). In 1983 the SNB allowed MBA growth to exceed the target in order to accommodate a decline in interest rates elicited by the cyclical contraction of 1981–1983 (Fig. 2). In this way, the SNB enhanced the stabilising powers of interest rates.²⁸ It justified the deviation by the need to react to a renewed real appreciation of the Swiss franc (*MB*, Dec. 1983, p. 3, *AR* for 1983, p. 7). In 1985 the SNB kept MBA growth below the target. Due to a massive increase in exports attributable to the strong appreciation of the US dollar in 1983–1984, output

27 The quantitative definition appeared again in the *AR* for 1987, p. 7. From 1988 to 1994, the SNB once again failed to provide a definition of price stability. Since 1995 (*AR* for 1994, p. 8) the SNB has spelled out explicitly its definition of price stability, i.e., an annual inflation rate of 1 percent until 1999 and less than 2 percent thereafter.

28 Recall that the demand for bank notes depends on the savings deposit rate and, therefore, responds to changes in market interest rates with a lag. This explains why demand for base money still grew relatively strongly in 1983 even though the cyclical contraction was about to end.

growth far exceeded the SNB's forecast (Table 2). The SNB seized the opportunity, offered by the excellent performance of the Swiss economy, to reduce MBA growth towards the new benchmark of 2 percent that it was to announce at the end of the year (*AR* for 1985, pp. 7–8). Even so, the deviations from the targets fixed for the years 1982 to 1986 were negligible (Table 1).

As far as the exchange rate was concerned, the fluctuations in the external value of the Swiss franc between 1982 and the summer of 1987 were more moderate than in the 1970s. Nevertheless, as already indicated, the SNB continued to take account of the exchange rate, especially in 1983 and 1985. Moreover, it undertook to explore various schemes for combining monetary targeting with target zones for the exchange rate of the Swiss franc, notably against the DM. However, the internal discussions of these schemes revealed the pitfalls of a target zone. If the SNB were to adopt a narrow zone, it would de facto return to a fixed exchange rate, while a wide one would not add much to the status quo. Furthermore, a target zone not disclosed to the public would probably be counterproductive, as it might enhance exchange rate volatility. Foreign exchange traders suspecting a modification in the monetary regime might test the SNB by driving up or down the exchange rate in order to force the policy makers to reveal the upper or lower bound of the target zone. For these reasons, the SNB did not warm up to the idea of a target zone. Since 1979, the SNB has not fixed – either formally or informally – targets for the exchange rate.

Communicating to the public the analytical framework underlying the benchmark and the annual targets raised a number of problems. Since the policy announcements were addressed to the general public, rather than to economic specialists, the SNB refrained from encumbering its policy statements with complicated technical details. Therefore, the SNB's December press releases did not cover the full internal analysis, but only contained the core required for understanding its intentions. Nevertheless, from the end of 1984 onwards, the press releases became more substantial and, in general, embraced the following points:

- Statements about the annual target for the following year and the benchmark growth in the monetary base.
- The SNB's quantitative forecasts of output growth and inflation for the following year.²⁹

29 Table 2 shows that the SNB began to publish its macroeconomic forecasts at the end of 1984. For reasons escaping my memory, it failed to publish forecasts for 1986.

- A statement about the expected activity-induced change in the demand for base money.
- A statement about the extent to which the annual target fixed by the SNB would serve to accommodate the expected activity-induced change in the monetary base.
- A statement about the state-contingent nature of the target.

More controversial was the question of whether the SNB, at least in qualitative terms, should also disclose its conditional forecasts of interest rates, as the public might misunderstand such forecasts and mistakenly treat them as operational targets. While the SNB at first remained silent on this issue, the press releases published between December 1986 and December 1989 contained statements on expected movements in interest rates (*QB*, Dec. 1986, p. 297, Dec. 1987, p. 231, Dec. 1988, p. 271, and Dec. 1989, p. 292).

Aside from announcing regularly its monetary targets, the SNB continued to expend considerable efforts in explaining to the public the key features of its policy approach. In his addresses to the annual meetings of 1982, 1983 and 1984, President Leutwiler dealt extensively with monetary policy. He pointed out why price stability was important for the economy. He also reviewed the costs and benefits of a monetary policy aimed at achieving and preserving price stability. He stressed that everybody perceived the costs of fighting inflation, while the benefits were less easy to see. The asymmetries in recognising these costs and benefits had contributed to the world-wide surge in inflation in the 1960s and 1970s. Moreover, during the recession of 1981–1983, Leutwiler admonished the SNB's critics, who were calling for an easier monetary policy in order to stimulate employment. Although a loose monetary policy might relieve temporarily the unemployment problem, he maintained, the SNB would run the risk of fuelling inflation in the longer run. Central banks performing their tasks properly could not help becoming unpopular at times. The SNB would lose its credibility if it were to depart from its stability-oriented course in an effort to gain short-term popularity. Finally, he replied to demands for low interest rates. He emphasised that a painless route to low interest rates did not exist. Instead, low interest rates were a reward to countries prepared to follow sensible monetary and fiscal policies.

4.2 *The Storm of 1987–1990*

In 1987, the real exchange rate of the Swiss franc once again reached levels (Fig. 3) that created difficulties for the domestic economy. A slowdown in real growth (Table 2) suggested that the cyclical expansion was coming to an end. Internal demand remained the only source of growth in the Swiss economy, while exports were stagnating. In the summer of 1987, the SNB realised that it would overshoot its monetary target unless it was prepared to curtail bank reserves and raise interest rates. In normal circumstances, the SNB would have stuck to its target and allowed interest rates to go up. However, it decided against curbing money growth because it was concerned that a rise in interest rates would magnify the upward pressures on the real exchange rate. Furthermore, after the stock market crash of October 1987, Swiss banks, like their counterparts in the US, endeavoured to augment their liquidity. As a result, short-term interest rates began to rise sharply. In an effort to avert a liquidity squeeze, the SNB supplied additional base money to the banks. For these reasons, the SNB exceeded the target for 1987 by about one percentage point (Table 1, *AR* for 1987, p. 8).

The discussions about the policy course to be pursued in 1988 were overshadowed by the dire forecasts of world economic growth that began to appear after the stock market crash. In addition to world economic developments, the launch of Swiss Interbank Clearing (SIC), the world's first electronic real-time gross settlement system, complicated the SNB's task of setting monetary policy. Thanks to SIC, domestic banks were able to curtail their holdings of base money. To allow banks to exploit fully the advantages of SIC, Swiss authorities agreed to cut banks' minimum reserve requirements, which had been placed at an excessively high level in the 1970s.³⁰ These innovations caused considerable uncertainty about the future development of base-money demand.

In these difficult circumstances, the SNB decided to rely on two scenarios for setting its policy course. The first scenario abstracted from the impending innovations and rested on the assumption that demand for base money would continue to evolve along past patterns. Considering its forecasts of output growth and inflation (Table 2), the SNB expected the activity-induced demand for base money to increase by 3 percent. If it were to keep the target at 2 percent, interest rates would have to rise. The uncertain prospects of the world economy, the high real exchange rate of the Swiss franc and possible detrimental effects of the

30 In Switzerland these requirements are known as liquidity requirements. In the 1970s they served as one among several instruments designed to absorb the monetary overhang created by speculative inflows of foreign capital.

stock market crash on domestic consumption ruled out an increase in interest rates (RICH, 1988).³¹ Therefore, the first scenario called for hiking the target to 3 percent. In the second scenario the SNB took account of the expected downward shift in money demand that was likely to arise from the impending financial innovations. Unfortunately, the SNB could not reliably forecast the extent of this shift, but internal research pointed to a drop in demand for base money by as much as 3 percent in 1988.

Because of these uncertainties, the SNB decided to lift the target to 3 percent. In its press release of December 1987, the SNB signalled the possibility of a fall in base-money demand that might call for undershooting the target. However, due to the extreme brevity of the press release (*QB*, Dec. 1987, p. 231),³² the public did not grasp the complexities of the analysis underlying the SNB's policy decision. In particular, the SNB failed to spell out fully the meaning of an annual monetary target in the presence of major financial shocks.³³

Immediately after the new reserve requirement regime had entered into force, the banks began to cut their holdings of base money. Bank reserves fell more quickly and more strongly than had been anticipated. As may be seen from Table 1, the demand shift assumed such proportions that the SNB was compelled to undershoot its target by about 7 percentage points. Furthermore, the banks' preference for a rapid reduction in their reserve holdings caused short-term interest rates temporarily to fall to very low levels. Nevertheless, the SNB was tardy in adjusting the supply of base money to the fast drop in demand. At the SNB's annual meeting of April 1988, President Languetin justified this procedure with a desire to ease the banks' adjustment to the new financial environment.

In the spring and summer of 1988, it became increasingly clear that the expected slump in the world economy would not materialise. On the contrary, a strong global recovery began to stimulate economic activity in Switzerland and elsewhere in Europe.³⁴ Since the Swiss economy was already operating at full capacity, the signs of a strong recovery conjured up the prospects of inflationary

31 Swiss non-banks held about 20 percent of their financial wealth in the form of equity, as compared with a share of 6 percent in Germany. The Swiss share was similar to those recorded for the United States and Canada.

32 The 1987 statement was shorter than any other press release published in the SNB's *QB* after 1983.

33 In its press release of December 1986 (*QB*, Dec. 1986, pp. 208–209), the SNB had already discussed the consequences of SIC for monetary policy, but did not take up this analysis in its policy statement for 1988.

34 Real GDP increased by 2.9 percent in 1988 as compared with a forecast of 1 percent by the SNB (Table 2).

overheating.³⁵ For this reason, the SNB decided to switch back to a restrictive stance in the summer of 1988. Due to the SNB's sluggish response to the drop in base-money demand, however, short-term interest rates continued to stay relatively low. Only in November 1988 did they start to rise above the levels before the stock market crash (Fig. 2). Therefore, partly against the SNB's intentions, monetary policy remained expansionary during much of the rest of 1988. The OECD (1989, p. 44) argued that MBA would have attained a growth rate of 4 percent in 1988 in the absence of any financial innovations.³⁶ Monetary policy turned out to be even easier than the SNB had foreseen at the end of 1987.

In December 1988, the SNB reduced the target again to 2 percent. Since activity-induced money demand was expected to increase by 4 percent, the SNB in its press release of December 1988 explicitly stated that it foresaw a rise in interest rates. It also stressed the continuing uncertainties with regard to the banks' reserve behaviour (*QB*, Dec. 1988, pp. 271–272). However, the SNB once again underestimated the cyclical expansion in the Swiss economy (Table 2), as the booming world economy continued to buttress domestic growth. Furthermore, Swiss franc strength gave way to a pronounced weakness pushing up the prices of imported goods (Fig. 3). In all likelihood, the decline in the Swiss franc exchange rate stemmed from the fact that the Bundesbank too was compelled to tighten severely monetary policy, as indicated by the sharp increase in German interest rates (Fig. 2). The SNB became concerned that the dangerous mix of continuing strong growth and domestic currency weakness might spark a new bout of inflation. Therefore, early in 1989, it tightened further its monetary reins. In his address to the annual meeting of April 1989, President Lusser emphasised that with hindsight the industrialised countries, including Switzerland, had pursued overly expansionary monetary policies in the past three years. Since the course originally fixed for 1989 was still too soft, the SNB would undershoot its target of 2 percent (Table 1). In its *AR* for 1989 (p. 9), the SNB attributed about half of the deviation from the target to its tighter course and the remainder to a further decline in bank demand for base money. As a result of the SNB's restrictive stance, short-term interest rates rose to almost 9 percent at the end of 1989 (Fig. 2).

For 1990, the SNB decided to maintain a target of 2 percent and to continue sticking to a restrictive course. The expected evolution of activity-induced money demand, the SNB announced, would call for interest rates to stay at their

35 The boom setting in during the spring and summer of 1988 also triggered a bubble in real estate and housing prices that burst early in the 1990s and caused severe problems among Swiss mortgage banks.

36 Internal calculations by the SNB yielded similar results (RICH, 1997, p. 122).

currently high levels or to increase even a bit further (*QB*, Dec. 1989, p. 292). While the SNB correctly forecast a decline in output growth, it grossly underestimated the inflationary pressures afflicting the Swiss economy (Table 2). Ushered in by a sharp increase in the oil price at the end of 1989, inflation soared to over 6 percent in the summer of 1990. In these uncomfortable circumstances, the SNB reluctantly decided once again to adopt a tighter course than it had announced. In the summer of 1990, first indications of a slowdown in real growth appeared on the scene. Therefore, the SNB cautiously tried to relax monetary policy.³⁷ As a result, the monetary base rebounded (Fig. 4). However, the economic effects of German reunification upset the SNB's calculations. Towards the end of 1990, German interest rates began to increase again, keeping the Swiss franc weak and putting continued upward pressure on the price level. Since the SNB could not but return to a restrictive policy, the monetary base ceased to expand. At the end of 1990, base-money growth for the third time in three years fell short of the SNB's target. However, the 1990 target miss no longer reflected shifts in demand for base money. It was due mainly to the necessity of pursuing a tighter course than the SNB had anticipated (*AR* for 1990, pp. 9–10).

The SNB's failure of containing inflation prompted a flood of criticism from various observers of Swiss monetary policy. Several commentators (e.g., CAPITELLI and BUOMBERGER, 1990) wondered whether the SNB had really grasped the policy implications of the financial innovations introduced earlier. The bland press release of December 1987 indeed conveyed the impression that the SNB was unaware of the policy challenges arising from the impending financial innovations. In his address to the annual meeting of April 1988, however, President Languetin clarified the meaning of the monetary target announced at the end of the preceding year. Due to the massive demand shift, MBA growth would fall short considerably of its target. The slip in short-term interest rates at the beginning of 1988 would remain temporary; a correction was already under way. President Languetin reminded the audience that the SNB had deliberately opted for an expansionary course. Subsequently, the SNB reiterated its position on several occasions. Despite these efforts of elucidating a complex policy situation, it did not succeed in freeing itself completely from the mistaken notion that its expansionary stance had reflected an inability to comprehend quickly enough the full consequences of SIC and the modifications in the liquidity regime.

37 The Gulf War of 1990 led to an inflow of save-haven funds to Switzerland, temporarily pushing up the exchange rate of the Swiss franc. This provided additional scope for easing monetary policy (*AR* for 1990, p. 9).

Another criticism addressed at the SNB concerned the causes of the surge in inflation at the end of 1989. Many analysts claimed that the SNB's easy stance of 1988 – whether deliberate or not – had triggered the subsequent increase in inflation. Although President Lusser in his address to the annual meeting of April 1990 accepted responsibility for the re-emergence of inflation, the reasons for the SNB's failure of preserving price stability are not as evident as might be believed at first sight. The SNB had clearly learnt a lesson from the unfortunate episode of 1978–1981. At the end of the 1980s, it endeavoured to react pre-emptively to the inflation threat, in contrast to its behaviour a decade earlier. It undertook to tighten monetary policy in the autumn of 1988, about a year before inflation began to soar. Needless to say, the SNB's pre-emptive action would have been more convincing had it tightened already in the spring or summer of 1988. I do not know to what extent an earlier switch to monetary restriction would have moderated the price increases of late 1989 and 1990. However, there is little doubt that monetary policy in this period was complicated by at least three factors.

First, the SNB was forced to pay a price for the cautious approach it had followed in the 1980s. To minimise the output effects of its anti-inflationary monetary policy, it had pursued an overly gradual course that had failed to restore fully price stability. Therefore, the expansionary external shocks of the late 1980s hit the Swiss economy at a time when inflation had not been conquered completely. This made it all the more difficult to ward off the expansionary forces and to contain the price increases.

Second, the inflationary impulses stemming from the external sector of the Swiss economy were reinforced by a variety of domestic indexing schemes that had taken root in the 1980s. A particularly pernicious scheme – still in existence today – involves the Swiss practice of linking housing rents to mortgage rates. Inflation, at least in the short run, tends to accelerate when mortgage rates increase as a result of a tighter monetary policy. In 1989 and 1990, the SNB's fight against inflation was severely hampered by the temporary stimulating effect on inflation of high interest rates.

Third, it is unclear whether the SNB in the late 1980s would have achieved better policy outcomes had it set its course on the basis of inflation forecasts, rather than monetary aggregates. At present, the SNB employs a variety of models for forecasting inflation and output growth. One of these is a large-scale structural model developed by STALDER (2001). Performing dynamic simulations for the 1980s and 1990s, Stalder finds that the forecasting properties of his model are satisfactory. Nonetheless, his simulations fail to account for a major portion of the pronounced increase in inflation in 1990 and 1991.³⁸ Interestingly, his forecasts closely match those actually published by the SNB. Thus, regardless of

the type of policy strategy followed, the SNB would likely have underestimated the rise in inflation in the late 1980s and early 1990s.

The repeated and massive deviations in base-money growth from the SNB's objectives discredited entirely the practice of setting annual monetary targets and called for a new policy approach.

5. Medium-Term Targets after 1990

5.1 *Trial and Error: 1990–1993*

At the end of 1990, the SNB announced a new policy strategy. It abandoned annual monetary targets and switched to a medium-term approach. According to its press release of December 1990, its aim was “to increase the monetary base to approach a medium-term expansion path.” This expansion path would define the evolution of the monetary base that the SNB considered being consistent with price stability and potential output growth of the Swiss economy. After re-examining the analysis underlying its benchmark for the monetary base, the SNB decided to fix the medium-term target at 1 percent per year. The reduction in the benchmark was motivated by two factors. First, ongoing innovations in the payments system had increased somewhat the trend growth in the income velocity of the monetary base. Second, and more important, the introduction of SIC and the modification of reserve requirements had altered substantially the composition of the monetary base. Bank notes now accounted for the lion's share of the monetary base.³⁹ Since the trend increase in income velocity was more pronounced for bank notes than for bank reserves, the compositional change had pushed up trend growth in velocity for the monetary base as a whole (*QB*, Dec. 1990, pp. 273–274).

38 See STALDER (2001, Fig. 3b). The numerical values of the forecasts for CPI inflation underlying his figure, on average, are 3.2 percent for 1990 and 4.2 percent for 1991. They are derived from within-sample dynamic simulations and represent one-year-ahead quarterly forecasts (information obtained from Stalder by e-mail on 18 Nov. 2002). The effective inflation rates amounted to 5.9 and 5.3 percent respectively (Table 2). Stalder models Swiss monetary policy with the help of a Taylor rule. This does not imply that the SNB actually followed a Taylor rule. As I show elsewhere (RICH, 2002, especially Fig. 6), the SNB's approach to monetary targeting yielded a path for short-term interest rates that frequently agreed with that derived from a Taylor rule.

39 The share of bank notes in the monetary base rose from about 70 to 90 percent and more after 1988.

The SNB decided to retain monetary targeting because of the strong leading-indicator role of money. While growth in the monetary base provided reliable information on the evolution of inflation in the medium and long runs, it was not a good predictor of short-term movements in the inflation rate. To stabilise inflation both in the short and long runs, the SNB would have to look at other indicators, besides money. Depending on the signals emitted by these additional indicators, the SNB might have to push money growth temporarily above or below the medium-term target. In particular, if a weak Swiss franc and/or a vigorous cyclical expansion abroad were to fuel domestic inflation, the increase in interest rates, triggered by a strategy of steady expansion in the monetary base, might not be sufficiently large to stabilise the price level. Even in the case of base-money demand, the interest sensitivity was too high for a policy of steady expansion in the money supply to act as an effective stabiliser. Therefore, to strengthen the stabilising role of monetary policy, the SNB would have to lower temporarily base-money growth below the medium-term target of 1 percent. The medium-term approach would compel the SNB to behave more pre-emptively. In this way, it would be able to prevent temporary surges in the inflation rate as had occurred in 1980/81 and 1989/90.

The SNB also pointed out that it would continue to rely on the monetary base as its target variable. The money stock M1 was also a good predictor of medium- and long-term movements in the inflation rate. However, due to its high interest sensitivity, the aggregate M1 was even less effective in stabilising short-term fluctuations in the inflation rate than the monetary base. Moreover, the SNB ruled out a target for the aggregate M3 because of its poor quality as a predictor of future inflation.⁴⁰

The SNB decided to set the target for a new version of the monetary base, i.e., the seasonally-adjusted monetary base (MBSA). Due to the financial innovations of the late 1980s, the pronounced month-end peaks in bank reserves had largely vanished and the monetary base could be smoothed by standard seasonal adjustment procedures. The annual targets for 1989 and 1990 had already been based on MBSA. Contrary to past practice, the target for 1990 had been defined as the percentage change in MBSA between the fourth quarter of 1989 and the fourth quarter of 1990.⁴¹ After 1990, the annual percentage change in MBSA,

40 These comments on alternative aggregates were based on research conducted by two staff members of the SNB (FISCHER and PEYTRIGNET, 1990). In the meantime, M3 has become a much better predictor of future inflation.

41 The target for 1989 also referred to the increase over the level recorded in the fourth quarter of the previous year. However, the SNB decided to compare the target with the average annualised

as reported by the SNB, always referred to the level in the fourth quarter over the level in the same period the year before.⁴²

The public welcomed the SNB's willingness to give up strict monetary targeting and to take account of other indicators besides money. Nevertheless, the press release of December 1990 raised various concerns among the public. Some observers of Swiss monetary policy believed that the SNB was about to shift to a discretionary policy approach. They bemoaned the vagueness of the press release, which did not commit the SNB to a precise policy framework. It is indeed true that the SNB's policy announcement of 1990 was not exemplary for its precision and clarity. Even though the press release provided a comprehensive general explanation of the SNB's medium-term strategy, it omitted three elements that were essential for understanding fully the new approach. These omissions were attributable to the fact that the SNB had not managed to tie up all the loose ends of the new medium-term strategy before the announcement of December 1990.

The first omission concerned the length of the target period. The medium-term nature of the new approach implied that the length of the target period should cover a full business cycle. Over a full cycle, the SNB would undertake to expand MBSA at an average rate of 1 percent per year. However, within the cycle, the SNB, if necessary, would push money growth above or below the medium-term target. In general, it would keep money growth below 1 percent during the expansion phase and above 1 percent during the contraction phase of the business cycle. Even so, the SNB fixed a target period of 3 to 5 years, which was shorter than the length of a typical business cycle. It was concerned that a period exceeding 5 years would fail to limit effectively its discretion in managing money growth. Because of these uncertainties, the SNB at first did not specify the length of the target period. In response to media complaints about the vagueness of the policy announcement, it subsequently explained that it had in mind a target period lasting 3 to 5 years.

The second omission concerned the "medium-term expansion path" envisaged by the SNB – a far trickier issue than the length of the target period. Observers of Swiss monetary policy generally assumed that the SNB would strive to keep the monetary base on a trend line starting at the level of MBSA recorded in the

monthly rates of change in MBSA relative to the fourth quarter of 1988 (Table 1). The rate of change in MBSA, therefore, did not depend on the level reached in the fourth quarter of 1989 alone. The SNB dropped this complicated procedure for calculating the annual rate of change in MBSA the following year because it was incomprehensible to the public.

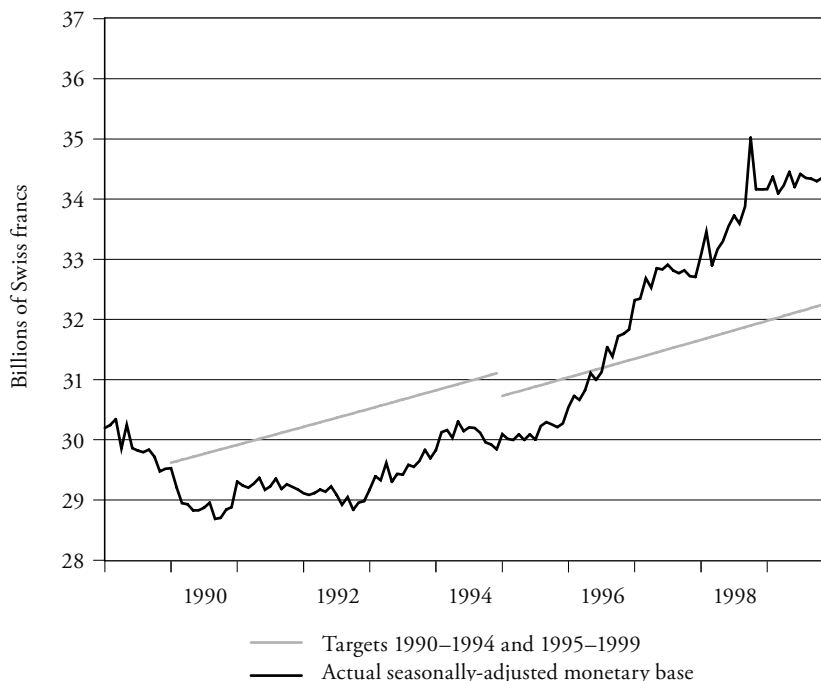
42 To estimate the activity-induced change in money demand, therefore, the SNB began to forecast the fourth-quarter-over-fourth-quarter change in the CPI and output. See also Table 2.

fourth quarter of 1990 and implying average annual growth of 1 percent. However, this interpretation of the SNB's intentions did not accord with the logic of the medium-term approach. On the contrary, strict application of the new approach called for a starting point of the expansion path that would lie substantially above the level of MBSA recorded in the fourth quarter of 1990. As may be gleaned from Fig. 4, MBSA at the end of 1990 was at a very low level, due to the restrictive course the SNB had pursued since the autumn of 1988. Once the SNB was able to ease monetary policy, short-term interest rates, which still amounted to roughly 8 percent, would have to fall drastically. Therefore, the SNB would have to raise money growth, at least for a while, above the medium-term target of 1 percent in order to accommodate the drop in interest rates. If the SNB were to prevent base-money growth from rising temporarily above 1 percent, monetary policy would be far too restrictive. The slowdown in real growth that had started in the summer of 1990 was about to develop into a veritable recession. Since an overly restrictive course would prolong unnecessarily the impending slump in activity, it was imperative to choose a strategy allowing for a temporary surge in money growth.

While the logic of the medium-term approach was clear, the SNB was less certain about the best way of communicating this idea to the public. Obviously, the SNB – at the end of 1990 – could not simply announce that it intended to keep money growth at an average of 1 percent over the next 3 to 5 years. Because it would be obliged, sooner or later, to boost money growth, it would, in all likelihood, overshoot the medium-term target. By setting an unrealistic medium-term objective prone to be missed, the SNB would needlessly discredit monetary targeting. For this reason, the SNB adopted another solution. It derived a medium-term target line for the *level* of MBSA, which it considered being in sympathy with price stability in the medium and long runs. Such a line could be obtained by moving the starting point of the target period back to the fourth quarter of 1989 (Fig. 4). The slope of the target line of course matched the medium-term target of 1 percent.

Once the target line was fixed, it was easy to describe the SNB's intentions. Its aim was to push MBSA up to the target line over the next 3 to 5 years. However, for the end-of-1990 to the end-of-1994 segment of the target period, this was not equivalent to stating that average growth in MBSA would amount to 1 percent. Over this sub period, growth in MBSA – by the laws of mathematics – would have to exceed 1 percent if the SNB was to reach the target line. Of course, the SNB could not determine the target line with scientific precision. For this reason, it was reluctant to disclose to the public the exact location of the target line. Only at the end of 1992 did the SNB clarify this issue when it revealed that the starting

Figure 4: Medium-Term Target Lines



point for calculating the medium-term target of 1 percent matched the actual level of MBSA recorded in the fourth quarter of 1989 (*QB*, Dec. 1992, p. 312). In the *AR* for 1992 (p. 9) the SNB also published a chart similar to Fig. 4.

The third element missing in the press release of December 1990 was a statement about the SNB's intentions for the immediate future. The press and other observers of monetary policy quickly realised that in the absence of an annual target, they did not really know what the SNB was up to in the coming months. To fill this void, President Lusser, in his address to the annual meeting of April 1991, announced that in the future the Swiss central bank would publish – at the beginning of each quarter – a forecast of the average level of MBSA in the subsequent three months.

Another, albeit less burning, issue concerned the controllability of MBSA. The financial innovations of the late 1980s not only altered the composition of the monetary base, but also eliminated to a large extent the interest sensitivity of the demand for bank reserves. This affected the SNB's ability to control MBSA.

After 1988, an easing of monetary policy no longer affected MBSA instantaneously through an increase in bank reserves, but only a few months later after a reduction in the rate on savings deposits had prompted the demand for bank notes to expand. In principle, the SNB could still control MBSA. However, MBSA no longer provided information on the SNB's current policy stance, as current movements in that aggregate reflected the policy measures taken a few months earlier. Instead, the SNB increasingly relied on short-term interest rates as a barometer of monetary ease or tightness.⁴³ In September 1993, the Governing Board instructed the economic staff to furnish regularly internal guidelines on the evolution of interest rates considered to be consistent with its planned course of action. These guidelines were not disclosed to the public but used by the SNB's operational department in managing bank liquidity.

The international environment, notably the economic consequences of German reunification, complicated considerably its task of fighting inflation without inflicting undue hardship on the real sector of the domestic economy. In 1991 the SNB continued to pursue the course initiated the year before and tried to expand cautiously MBSA. In effect, the SNB's course was a bit more expansionary than indicated by the recorded growth in MBSA because of a further downward shift in the demand for bank reserves. Contrary to expectations, inflation remained stubbornly high in 1991. Therefore, the inflation figure of 5.3 percent attained in the fourth quarter of 1991 once again exceeded the SNB's forecast (Table 2).

At the end of 1991, the SNB pointed out that the international environment severely limited its room for manoeuvre. The high level of interest rates in Europe, reflecting the tight monetary policy pursued by the Bundesbank in the wake of German reunification, continued to put downward pressure on the Swiss franc, which in turn kept domestic inflation relatively high. Considering these uncertainties, the SNB could not help issuing a relatively vague press release even though it made clear that it would continue to pay a great deal of attention to the exchange rate (*QB*, Dec. 1991, p. 318). In March 1992 it was confronted with a sharp depreciation of the Swiss franc (Fig. 3), resulting from euphoria about the proposed new common European currency, elicited by the passage of the Maastricht Treaty. The SNB, reluctantly, decided to tighten monetary policy because the turmoil on the foreign exchange market threatened to undermine its anti-inflationary policy. As a result, interest rates rose again, causing MBSA to contract (Fig. 4). Fortunately, the SNB did not maintain its tight stance for long. The crisis in the European Monetary System breaking out in the summer

43 The SNB discussed the problems arising from the control of MBSA in its *AR* for 1991, p. 9.

of 1992 reversed the trend in the Swiss franc exchange rate. The much-awaited appreciation of the Swiss franc allowed the SNB to reduce significantly domestic interest rates even though German rates remained high until well into 1993 (Fig. 2). Because of the decline in domestic interest rates, MBSA began to rise again near the end of 1992.

In December 1992 the SNB announced that the fall in interest rates would be associated with a renewed increase in MBSA. Growth in MBSA in 1993 would probably exceed the SNB's medium-term target of 1 percent. The overshoot would be necessary if the SNB was to attain its medium-term objective.⁴⁴ As may be seen from Fig. 4, the SNB succeeded in pushing up MBSA towards the medium-term target line. Short-term domestic interest rates fell further and reached roughly 4 percent at the end of 1993. Inflation also dropped and stood at 2.5 percent in the fourth quarter of 1993, in line with the SNB's forecast. Real output remained depressed, but near the end of 1993, first signs of a recovery could be detected. The SNB admitted that it was partly responsible for the recession or stagnation in the Swiss economy that had begun in 1991 (Table 2). However, in his address to the 1993 annual meeting, President Lusser stressed that no central bank could fight inflation without imposing real costs on the economy in the form of temporary output and employment losses.

The dire state of the Swiss economy prompted critics of Swiss monetary policy to argue that the SNB was following an excessively restrictive policy. For example, at the end of 1990, Kurt Schiltknecht, the former chief economist of the SNB, complained that Swiss monetary policy makers were about to engineer an "overkill", should they continue with the tight course they had pursued in the past two years. Comparing the patterns for M1 growth and inflation recorded during the difficult period 1987–1990 with those observed during the similarly difficult period 1977–1981, Schiltknecht predicted a drop in the rate of increase in the CPI to 1 percent by the end of 1992. This implied that the SNB had effectively conquered inflation and could now return to a substantially easier stance. Needless to say, Schiltknecht's forecast was not borne out by subsequent developments, as inflation at the end of 1992 still hovered about 3.5 percent. Like other forecasters, including the SNB, he underestimated the stubbornness of Swiss inflation in 1991 and 1992.

44 *QB*, Dec. 1992, pp. 311–312. Since the first three years of the target period had already elapsed by the end of 1992 and since the SNB did not fix a new medium-term target, the public, implicitly, was made to understand that the target period would last longer than three years.

5.2 *Money as a Useful Indicator: 1994–1996*

When the SNB set its policy course for 1994, the economic environment had brightened considerably. Inflation had fallen to slightly more than 2 percent. Furthermore, forecasters, including the SNB, anticipated a modest recovery of the Swiss economy (Table 2). In these circumstances, the SNB decided to increase MBSA further towards the medium-term target line, but at a slower rate than in 1993. Considering its forecasts, the SNB expected the activity-induced increase in base-money demand to fall short of the planned expansion in supply. Therefore, the efforts of taking MBSA closer to the target line would imply a further fall in short-term interest rates.

The press release of December 1993 (*QB*, Dec. 1993, pp. 265–266) did not mention a figure for the planned increase in MBSA for 1994. It merely stated that the SNB intended to augment MBSA by more than 1 percent, but by less than in 1993. Furthermore, the press release stated that short-term interest rates would probably decline slightly in 1994.

Even though MBSA was on a clear upward path at the beginning of 1994 and there were also signs of output growth picking up, doubts about the robustness of the recovery lingered on. The real exchange rate of the Swiss franc continued to increase, notably against the Italian lira, which had been allowed to float after the outbreak of the EMS crisis. Nevertheless, the Swiss economy remained on a recovery path. MBSA, by contrast, reached a peak in the summer of 1994 and began to decline again. The renewed fall in MBSA was worrying in view of the still fragile state of the economy. Despite the adverse signals from MBSA, the SNB insisted on keeping interest rates at the level attained at the end of 1993. It was concerned that the nascent cyclical recovery, combined with an impending major reform of indirect taxation, would push up inflation if it were to lower interest rates. At the beginning of 1995, Switzerland was set to introduce a value-added tax that was expected to lead to a temporary jump in inflation.⁴⁵

At the end of 1994, the SNB conducted an extensive internal debate about its policy approach. Since the starting point of the medium-term target line had been predated to the fourth quarter of 1989, the target period of 3 to 5 years definitively came to an end. The SNB decided to stick to the medium-term approach and set a new target line covering the five-year period from the end of 1994 to the end of 1999. It fixed the initial point of the new target line below the terminal point of the old one in order to accommodate the downward shift in bank reserves in 1991 (Fig. 3).⁴⁶

45 VAT replaced an old-fashioned turnover tax that involved multiple taxation of a wide range of goods, but failed to cover services.

In the context of the debate on the medium-term strategy, the SNB also decided to lower short-term interest rates. In its *AR* for 1994 (pp. 9–10), it admitted that contrary to its intentions, it had failed to reduce the negative gap between the actual level of MBSA and the medium-term target line. It attributed this failure to the downward shift in the demand for bank reserves and the lower than expected increase in the CPI. It also stressed that the shortfall in the activity-induced increase in money demand had required a monetary policy response. Although, towards the end of 1994, it had allowed short-term interest rates to decline, this corrective action had come too late to boost MBSA growth already in that year.

As to the course to be pursued in 1995, the SNB departed from a relatively optimistic forecast of output growth. Forecasters inside and outside the SNB generally expected the major European economies to pick up. Nevertheless, the SNB made every effort to push up MBSA near the medium-term target line. Since the Swiss recovery appeared to gain momentum, the SNB did not see a need for aggressive easing of monetary policy and for reaching the target line already by the end of 1995, especially in view of the impending VAT-induced price increases. Considering its estimates of the activity-induced increase in money demand, the SNB expected short-term interest rates to fall further at first and to rise again towards the end of 1995. Of course, SNB was aware that its rosy scenario involved a significant dose of downward risk. It was determined to stick to its plans for expanding MBSA regardless of the economic situation. If real growth should turn out to be weaker than expected, the SNB's intended course of action would cause interest rates to drop more strongly than expected and act as a cyclical stabiliser. The press release of December 1994 (*QB*, Dec. 1994, p. 274) summarised this analysis, without providing a conditional forecast for interest rates. The SNB stressed that it was only willing to accommodate the first-round effects of VAT on the price level, but no second-round effects by way of higher nominal wages and other production costs.⁴⁷

As may be seen from Table 2, the SNB, along with the other forecasters, overestimated the strength of the recovery in the Swiss economy. Contrary to the wishes of the SNB, MBSA in the first months of 1995 failed to rebound. For this reason, the SNB – from the spring of 1995 onwards – began to cut interest rates

46 *QB*, Dec. 1994, pp. 273–274. The SNB also accommodated the first round effects of the VAT on the CPI. This press release contained a detailed discussion of the various factors prompting the shift in the target line.

47 It had outlined its reaction to VAT already on earlier occasions. See, for example, the address by President Lusser to the annual meeting of April 1994, Section 3.

aggressively. As a result, the three-month deposit rate fell from 4 percent in January 1995 to about 2 percent in November (Fig. 2). Fortunately, the SNB was now taking seriously the disturbing signals coming in from money growth and was allowing interest rates to deploy their stabilising function. In the first months of 1995, the outlook still seemed favourable,⁴⁸ but as the year wore on, dark clouds appeared on the economic horizon. Even though the neighbouring European countries continued to grow modestly, the Swiss recovery began to stall. The main reason for the new bout of anaemia afflicting the Swiss economy lay in the massive real appreciation of the Swiss franc.⁴⁹ The sharp drop in short-term interest rates helped to relieve the upward pressure on the domestic currency. After the real exchange rate of the Swiss franc had reached a high plateau in April 1995, it began to decline towards the end of the year (Fig. 3). Moreover, growth in MBSA started to accelerate towards the end of 1995 (Fig. 4).⁵⁰ However, the easier monetary policy did not start to make an imprint on real growth until the beginning of 1997. The year 1996 saw continued stagnation of the Swiss economy, chiefly because of an unexpected slowdown in German real growth. This prompted the SNB to relax monetary policy once more in December 1995. For this reason, the three-month deposit rate fell to a low of 1.8 percent. In the summer of 1996, the SNB finally attained its objective of lifting up MBSA to the medium-term target line. Inflation remained low and fell to less than 1 percent in 1996.

Even though in 1995 it had relaxed drastically monetary policy, the SNB under Markus Lusser's presidency was blamed for having prolonged the economic stagnation of the 1990s through an overly restrictive course. Certainly, had the SNB allowed short-term interest rates to fall already in the summer of 1994, it would probably have been able to mitigate earlier the upward pressure on the real exchange rate of the Swiss franc. However, it did ease monetary policy at the end of 1994 and in the spring of 1995 it relaxed monetary policy decisively when the recovery was about to stall again. Perhaps, the public did not sufficiently appreciate these efforts of counteracting the downturn in economic activity because

48 See the still relatively optimistic assessment of the Swiss economy provided by President Lusser in his address to the annual meeting of April 1995.

49 The SNB (*QB*, Dec. 1995, p. 305) mentioned two other reasons for the recovery not gaining momentum in Switzerland: (1) Due to the burst of the housing bubble and the resulting emergence of a serious non-performing-loans problem, the banks had become reluctant to grant new credit. (2) During the cyclical expansion of the 1980s, the public sector had amassed high structural deficits that required correction.

50 The SNB repeatedly stressed that it was monitoring the other monetary aggregates too (e.g., *QB*, Dec. 1993, p. 266). Growth in M1 had already begun to pick up at the beginning of 1995 (Fig. 1).

the SNB was reluctant to emphasise its shift to monetary ease. Remembering its difficulties in the earlier period 1978–1981, it repeatedly pointed to possible conflicts between its primary task of preserving price stability and public demands for a lower real exchange rate.⁵¹ It was clearly the SNB's task to stress the importance of preserving price stability. However, with hindsight, the SNB would have described more accurately its actual policy course had it admitted that it was taking account of the exchange rate and easing decisively monetary policy.

6. Summary and Conclusions

After the switch to a floating exchange rate early in 1973, the SNB adopted a policy strategy based on monetary targets. From the end of 1974 to the end of 1977, it set annual growth targets for the money stock M1 and after 1979 for the monetary base. In 1991 it shifted to a medium-term targeting strategy for the monetary base. At the end of 1999, the SNB abandoned monetary targeting altogether in favour of an approach resting on inflation forecasts.

Since Swiss experience with monetary targeting has been researched extensively, my study focuses on an aspect that has not received much attention. I show how the SNB used its internal policy analysis in setting monetary policy and in communicating its decisions to the public. An examination of these issues is interesting because it sheds light on the problems the SNB encountered in trying to extract useful policy signals from money growth.

Monetary targets acted as an effective anchor prompting the SNB not to lose sight of its ultimate policy objective – price stability. Under the annual monetary targeting regime in force until the end of the 1980s, the SNB was able to develop a coherent and effective framework for analysing and communicating monetary policy. Under this framework, the SNB – relying on forecasts for real GDP growth and inflation for the following year – predicted activity-induced changes in money demand. Moreover, it compared the expected demand changes with a benchmark for money growth. The benchmark defined the trend rate of money growth that the SNB thought to be consistent with price stability and potential real growth in the Swiss economy. On the whole, this framework provided for a highly transparent monetary policy.

51 See such statements in *QB*, Dec. 1995, p. 306, and the *AR* for 1995, p. 9. However, in his – last – address to the annual meeting of April 1996, President Lusser explicitly stated that the SNB had exploited fully its room for manoeuvre and had attempted to soothe the pains of domestic industry by lowering short-term interest rates.

Nevertheless, annual monetary targets suffered from a number of drawbacks lessening their usefulness as a policy device. Even though the SNB stressed the state-contingent nature of its targeting approach, it preferred to pursue a strategy of steady money growth in practice. While steady money growth was normally an appropriate strategy, it was unsuitable in the presence of major unexpected shocks bound to harm the domestic economy. Such shocks included money-demand shifts and excessive movements in the exchange-rate of the Swiss franc. For this reason, annual targets did not always prompt the SNB to react appropriately to unexpected shocks. Another problem arose from cyclical fluctuations in output growth and inflation. Due to the annual targeting framework, the SNB failed to adopt a sufficiently pre-emptive stance in countering cyclical threats to price stability. In the presence of high interest elasticity of money demand, in particular, a strategy of steady money growth failed to smooth cyclical fluctuations in inflation and output. Unexpected shocks also complicated the SNB's communication efforts. In difficult economic circumstances, the annual targeting framework did not necessarily prompt the SNB to choose optimum procedures for explaining its policy decisions to the public.

Upon the switch to the medium-term targeting approach, the SNB undertook to rectify the flaws of its annual targeting framework. The idea was to fix a medium-term target line for the monetary base, matching the trend growth in this aggregate consistent with price stability and potential growth. In the presence of major shocks threatening to disturb price stability, the SNB, if necessary, was prepared to deviate from its medium-term target line. While the medium-term strategy was superior to annual targeting, it was fraught with a variety of difficulties too.

At least initially, the SNB's efforts of explaining to the public its new and rather complex approach left something to be desired. Another difficulty arose from the question of how the SNB should take account of cyclical movements in aggregate demand. The need of recognising the cyclical state of the economy bore both on the SNB's communication efforts and its internal analysis. As to its public pronouncements, the SNB was reluctant to admit that – among other indicators – it was considering the business cycle in ascertaining the need for deviations in money growth from the medium-term target line. Its reluctance to talk about the business cycle was understandable. It had consistently emphasised that price stability should serve as the primordial objective of monetary policy. It had also warned against an activist policy approach aimed at achieving multiple objectives of high employment and price stability. Notably, it had taken great pains of explaining to the public a simple point: Central banks paying too much attention to employment and output were liable to miss the overriding objective of price stability. Considering its past pronouncements, the SNB was worried that

the public might mistake references to the indicator role of the business cycle for a shift to an activist policy approach. However, despite these concerns, the SNB, in practice, could not help taking account of the business cycle if it was to react pre-emptively to threats of inflation or deflation.

Recognising the business cycle also raised a tricky analytical question. The SNB realised that the required deviations from the medium-term target line could be determined only on the basis of inflation forecasts over horizons long enough to capture the full effects of destabilising shocks and of the policy reactions to such shocks. The need for longer-horizon forecasts posed a dilemma for Swiss policy makers: Either the SNB continued to fix a medium-term target but supplemented its targeting framework by appropriate longer-horizon inflation forecasts. Since at the end of 1996 new instabilities in demand caused the monetary base to move far above the medium-term target line (Fig. 4),⁵² the SNB could not maintain a credible monetary target unless it chose a new target variable such as the aggregate M3, which had become a fairly reliable advance indicator of longer-run fluctuations in the inflation rate. Or the SNB moved in the direction of inflation targeting and placed long-horizon inflation forecasts at centre stage, with the analysis supplemented by a discussion of the role played by money in forecasting inflation. At the end of 1999, the SNB resolved this dilemma. It decided to abandon monetary targeting in favour of an approach based on inflation forecasts. It believed that inflation forecasts were easier to communicate to the public than its medium-term strategy. Moreover, the SNB harboured doubts about its ability of forecasting short-run developments in the aggregate M3.⁵³

The new approach is similar to monetary targeting in the sense that price stability continues to serve as the main objective of Swiss monetary policy. The monetary target was never an end in itself. It always played a subordinate role to the SNB's ultimate objective since it served as an instrument for achieving and preserving price stability. In case of doubts about the indicator function of money, the SNB was prepared to deviate from its monetary target in order not to miss its ultimate objective. Therefore, I would not be surprised if an application of the BERNANKE and MIHOV (1997) analysis to the SNB were to yield similar results as for the Bundesbank.

52 The upward shift reflected an unexpected increase in the circulation of large-denomination bank notes, which was probably related to the impending introduction of the euro. Circumstantial evidence suggests that some holders of DM-notes strove to avoid direct conversion into the new common European currency by using the Swiss franc as an entrepôt.

53 See RICH (2000) for a full discussion of the reasons for abandoning monetary targeting. The relationship between Swiss M3 growth and the inflation rate is complex (JORDAN et al., 2001).

Nevertheless, it would be misleading to characterise the SNB's monetary targeting strategy as inflation targeting in disguise. Monetary targeting and the SNB's current approach differ in a crucial respect: Under monetary targeting, the SNB based its analysis and communication on a comparison of the activity-induced growth in money demand with an appropriate benchmark. Even though it did predict real growth and inflation, it did not base its policy decisions on inflation forecasts. These forecasts were needed only to estimate the expected activity-induced change in money demand. Upon the switch to the new approach, the nature of the SNB's forecasts altered fundamentally. They became the pivot of Swiss monetary policy. However, placing the inflation forecasts at centre stage required an extension of the forecast horizon to three years, that is, a period long enough to match the lags in the effects of monetary policy. In this way, the SNB is now able to capture all the information relevant for forecasting future inflation although money growth, in practice, still plays an important role in predicting price movements over periods exceeding two years.

In summary, despite the flaws in the SNB's monetary targeting strategy, money, for the most part, turned out to be a highly useful guide to policy makers, as it helped to keep the trend increase in the CPI at low levels. For this reason, over the last quarter of the twentieth century, the SNB managed to achieve a lower inflation rate than virtually all the other central banks. Aside from a few lapses, the SNB was also effective in communicating its policy plans to the public. Its public announcements almost always matched its internal analysis and its decisions. Moreover, the public generally understood what the SNB intended to do. These factors appear to account for the high degree of credibility the SNB has enjoyed to this day.

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